REMARKS

By this reply, claim 1 has been amended. Claims 1-20 are pending in the application. Support for the claim amendments can be found in the specification at, for example, page 9, lines 12-15; page 10, line 27 to page 11, line 4; and the paragraph bridging pages 19 to 20. The specification has been amended in the "DISCLOSURE OF THE INVENTION" section to be consistent with amended claim 1. No new matter has been added by the amendments. Reconsideration and allowance are respectfully requested in view of the following remarks.

Drawings

The Examiner is again respectfully requested to indicate in the next Patent Office communication whether the proposed drawing change submitted on April 3, 2002, is acceptable.

Priority Under 35 U.S.C. § 119

As was discussed in the Amendment filed on June 27, 2005, the present application is a U.S. National Stage of International Application No. PCT/JP01/06724, and claims foreign priority to JP 2000-244026. The Office's Public PAIRS system indicates that a copy of the foreign priority papers was filed on April 3, 2002. However, the Office Action does not acknowledge receipt of the priority document. In the next Office communication, the Examiner is requested to acknowledge the claim for foreign priority and receipt of the priority document.

Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 1-20 stand rejected under 35 U.S.C. § 112, second paragraph, for the reasons stated at page 2 of the Office Action.

Claim 1 has been amended to address the Examiner's objections to the terms "the control factor" and "the control." The amendments to claim 1 clarify how the recited one or more "control factors" are related to the data analysis and to obtaining control data for reclaiming the production process. Applicants respectfully submit that one having ordinary skill in the art would understand the meaning of claim 1 when read in light of the specification and the drawings.

More particularly, claim 1, as amended, recites a method for controlling production process without having resort to preparation of a calibration curve. The method comprises the features of "taking an absorbance spectrum for each of a plurality of standard samples collected from a production process step in an analysis range including near-infrared region, constructing a data base from a differentiation curve of a near-infrared spectrum chart obtained using a plurality of production products that had been judged by conventional chemical analysis to be rated products, by calculating standard deviations and the average intensity of the standard samples (standard average intensity) in respect of each of the wave lengths selected from the spectrum included in the said analysis range at a constant interval, taking an absorbance spectrum in the said analysis range for each analysis sample collected from the production process step and comparing the resulting absorbance spectrum with the data base, estimating deviation (analysis deviation) of the intensity of the absorbance spectrum of each of the analysis samples (analysis intensity) at each of the said selected wave lengths from the standard average

intensity, comparing, when the absorbance spectrum includes wave length(s) at which the analysis deviation of the absorbance of the analysis sample is outside a tolerance limit determined based on the standard deviation, the wave length showing the analysis deviation of the absorbance outside the tolerance limit with production information given preliminarily in the data base in order to find out one or more control factors responsive to said analysis deviation of absorbance of the analysis sample, estimating control data for reclaiming the production process based on the one or more control factors, and controlling the production process so as to obtain production product within the said tolerance limit by inputting the said control data to the production process step" (emphasis added).

The specification describes Examples of practicing the claimed method for controlling exemplary production processes. In EXAMPLE 1 described at pages 25-27 of the specification, a polyolefin resin production process is controlled. In the process, an olefinic polymer comprising 4-methyl-pentene-1 is polymerized in the presence of a catalyst to produce polyolefin resin. A second derivative curve of an NIR absorption spectrum chart of collected process samples is compared with that of each raw material stored in the data base to determine the causal origin of the abnormal analysis deviation (i.e., an excess over the tolerance limit 3σ) in order to detect a control factor attributive to the occurrence of the abnormal analysis deviation (i.e., an excessive amount of raw material (B) is detected), whereupon control data for regaining normal production are estimated based on the control factor (i.e., decreasing the supply rate of raw material (B)) and inputted to the production process step to reclaim the process.

In EXAMPLE 2 described at pages 27-29 of the specification, a process for producing a polyester resin is controlled. In the process, polyester resin product is monitored by an NRI absorption spectrum second derivative chart and, upon detection of abnormal analysis deviation (i.e., an excess over the tolerance limit 3σ) on the chart, the control factor is found from the wave length showing the abnormal analysis deviation (at 2034 nm) to be the product color, based on the absorbance at 2034 nm corresponding to the characteristic absorption peak (band) attributive to the influence on the product color. From the determination of the control factor, control data to be inputted to the process step is estimated to be the feed rate of stabilizer. By altering the feed rate of the stabilizer, normal production of the product is regained.

In a case where abnormal analysis deviation of product sample is observed at the wave length of 1224 nm, the control factor is detected from the production information stored in the data base to be diethylene glycol formed during resin production, based on the characteristic absorbance peak of remaining diethylene glycol in the polyester product being in the vicinity of 1224 nm. Therefore, the control data to be inputted to the production process step is estimated to reside in polymerization conditions for increasing or decreasing the amount of diethylene glycol formed. When the analysis deviation exceeds -3σ, the production process is operated under addition of diethylene glycol monomer for normal production.

In a further case where abnormal analysis deviation of product sample is observed at the wave length range of 1710-1538 nm, the control factor is detected from the production information stored in the data base to be the inherent viscosity value (IV), based on the characteristic absorbance peaks of the product attributive to

the IV value being in this wave length range. Then, the control data is estimated based on the control factor. When the analysis deviation for the peaks in this range exceeds +3σ, operation conditions of production processes are changed in such a manner that the level of the IV value of the polymerization product in the polymerization reactor is lowered, or that the supply rate of the heating inert gas is decreased, or that the temperature of the preheating phase in a solid phase polymerization is lowered, to thereby regain normal product of the production process. When the analysis deviation exceeds -3σ, the operation condition of the production process discussed above is reversed.

In EXAMPLE 3 described at pages 29-30 of the specification, production processes for producing phenols by cleavage of hydroperoxide of alkylbenzenes are controlled. In the process, product is monitored with an NIR absorption spectrum second derivative chart. Upon detection of abnormal analysis deviation (excess over the tolerance limit 3σ) on the chart, the control factor is found from the wave length showing the abnormal analysis deviation (at 1978 nm) to be attributive to the hydroperoxide, based on the hydroperoxide having a characteristic absorbance at 1978 nm. Then, the control data is estimated from the production information stored in the data base to be the feed rate of sulfuric acid. Normal product is obtained by adjusting the feed rate of sulfuric acid. In a similar way, occurrence of abnormal product due to abnormalities in control factors of sulfuric acid (having a characteristic absorbance peak at 2036 nm), water (having characteristic absorbance peaks at 1900 nm and 1400 nm) and phenol (having a characteristic absorbance peak at 1930 nm) are remedied by adjusting the feed rate (control data) for each control factor.

Applicants respectfully submit that one having ordinary skill in the art would understand the meaning of claim 1 in view of the specification and drawings, including how one or more control factors can be determined and also how the control factors can be used to obtain control data for reclaiming the production process. Accordingly, claim 1 and dependent claims 2-20 are in compliance with the requirements of 35 U.S.C. § 112, second paragraph. Therefore, withdrawal of the rejection is respectfully requested.

Rejection Under 35 U.S.C. § 103

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,072,576 ("McDonald") in view of U.S. Patent No. 6,820,013 to Frickel et al. ("Frickel") for the reasons stated at pages 3-4 of the Office Action. The rejection is respectfully traversed.

As acknowledged in the Office Action, McDonald does not disclose or suggest a production control method that does not require preparation of calibration curve plots. Accordingly, McDonald does not suggest the method for controlling production process without having resort to preparation of a calibration curve recited in claim 1.

Frickel has been cited in the Office Action to allegedly cure the deficiencies of McDonald. Frickel is based on a PCT application. The PCT application was published on July 5, 2001 in German. Accordingly, the PCT publication has no 35 U.S.C. § 102(e) date and can be applied as a reference as of its publication date of July 5, 2001. The present application claims foreign priority under 35 U.S.C. § 119 to Japanese Application No. 2000-244026, filed on August 7, 2000. Accordingly, the priority date of the present application is earlier than Frickel's PCT publication date.

In order to perfect the claim for priority and thus eliminate Frickel as a reference with respect to the present application, attached are an English-language translation of the priority application together with a statement that the translation is accurate, in accordance with the provisions of M.P.E.P. § 201.15. Accordingly, withdrawal of the rejection is respectfully requested for this reason.

Applicants further note that McDonald's method not only uses a calibration curve, but also lacks various other features of claim 1. For example, McDonald fails to suggest the features of "constructing a data base from a differentiation curve of a near-infrared spectrum chart obtained using a plurality of production products that had been judged by conventional chemical analysis to be rated products, by calculating standard deviations and the average intensity of the standard samples (standard average intensity) in respect of each of the wave lengths selected from the spectrum included in the said analysis range at a constant interval" and "taking an absorbance spectrum in the said analysis range for each analysis sample collected from the production process step and comparing the resulting absorbance spectrum with the data base." McDonald also does not suggest the features of "comparing, when the absorbance spectrum includes wave length(s) at which the analysis deviation of the absorbance of the analysis sample is outside a tolerance limit determined based on the standard deviation, the wave length showing the analysis deviation of the absorbance spectrum outside the tolerance limit with production information given preliminarily in the data base in order to find out one or more control factors responsive to said analysis deviation of absorbance of the analysis sample," "estimating control data for reclaiming the production process based on the one or more control factors" or "controlling the production process so as to obtain

production product within the said tolerance limit by inputting the said control data to the production process step," as recited in claim 1. In light of the substantial differences between McDonald's method and the claimed method, Applicants respectfully submit that one having ordinary skill in the art would not have been motivated to modify McDonald's method to result in the claimed method.

For at least the foregoing reasons, claim 1 is patentable. Claims 2-20, which depend from claim 1, are also patentable for at least the same reasons as those for which claim 1 is patentable. Therefore, withdrawal of the rejection is respectfully requested.

Conclusion

For the foregoing reasons, allowance of the application is respectfully requested. If there are any questions concerning this response, the Examiner is respectfully requested to contact the undersigned at the number given below.

Respectfully submitted,

BUCHANAN INGERSOLL PC (INCLUDING ATTORNEYS FROM BURNS DOANE SWECKER & MATHIS)

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